



FORM PTOL 849B

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICEATTY. DOCKET NO.  
SYMYX/008 DIV. CONAPPLN. NO.  
10/719,441INFORMATION DISCLOSURE  
STATEMENT BY APPLICANTAPPLICANT  
Yumin Liu

CONFIRMATION NO. :

FILING DATE  
November 20, 2003

GROUP

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
TN	3,502,737 ✓	03/24/70	Ghublikian	260	669	
	3,670,044 ✓	06/13/72	Drehman et al.	260	683.3	
	3,678,124 ✓	07/18/72	Stepanov et al.	260	680	
	3,832,205 ✓	08/27/74	Lowery	106	288	
	3,862,256 ✓	01/21/75	Isailingold et al.	260	654	
	3,901,828	08/26/75	Mai et al.	252	462	
	3,907,834	09/23/75	Milberger et al.	260	346	
	3,929,670	12/30/75	Kudo et al.	252	455	
	4,003,978	01/18/77	Shiraishi et al.	423	237	
	4,059,664	11/22/77	Nicolas et al.	264	66	
	4,070,413 ✓	01/24/78	Imai	260	683.3	
	4,115,441 ✓	09/19/78	Shaw et al.	562	534	
	4,176,140 ✓	11/27/79	Bertus et al.	585	629	
	4,180,690 ✓	12/25/79	Imai	585	443	
	4,250,346 ✓	02/10/81	Young et al.	585	658	
	4,251,394	02/17/81	Carter et al.	252	452	
	4,283,307 ✓	08/11/81	Barone et al.	252	432	
	4,296,607 ✓	10/27/81	Lawless	62	6	
	4,374,758	02/22/83	Sasaki et al.	252	439	
	4,408,067	10/04/83	Nakamura et al.	560	215	
	4,418,007	11/29/83	Derrien	502	312	
	4,435,607 ✓	03/06/84	Imai	585	443	
	4,565,898 ✓	01/21/86	O'Hara et al.	585	441	
	4,568,790 ✓	02/04/86	McCain	585	658	
	4,613,715 ✓	09/23/86	Haskell	585	412	
✓	4,657,653	04/14/87	Bouet	204	290	

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EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
TN	4,672,146 ✓	06/09/87	Abrevaya et al.	585	660	
	4,709,071 ✓	11/24/87	Sasaki et al.	558	322	
	4,717,694	01/05/88	Tamura et al.	501	135	
	4,769,357	09/06/88	Sarumar et al.	502	245	
	4,788,371 ✓	11/29/88	Imai et al.	585	443	
	4,940,826 ✓	07/10/90	Font Freide et al.	585	600	
	4,996,387 ✓	02/26/91	Gerhold et al.	585	654	
	5,053,084	10/01/91	Masumoto et al.	148	11.5	
	5,053,577 ✓	10/01/91	Teller et al.	585	500	
	5,086,032	02/04/92	Mazzocchia et al.	502	315	
	5,094,990 ✓	03/10/92	Sasaki et al.	502	214	
	5,136,104	08/04/92	Saito et al.	568	431	
	5,162,578 ✓	11/10/92	McCain, Jr., et al.	562	512.2	
	5,210,293 ✓	05/05/93	Kitson	562	512.2	
	5,219,816 ✓	06/15/93	Zhou et al.	502	223	
	5,376,613 ✓	12/27/94	Dellinger et al.	502	304	
	5,380,692	01/10/95	Nakatsuji et al.	502	303	
	5,393,622	02/28/95	Nitta et al.	429	223	
	5,430,209 ✓	07/04/95	Agaskar et al.			
	5,439,859 ✓	08/08/95	Durante et al.	502	66	
	5,447,705	09/05/95	Petit et al.	423	418.2	
	5,593,935 ✓	01/14/97	Golunski et al.	502	339	
	5,723,707 ✓	03/03/98	Heyse et al.	585	444	
	5,733,518 ✓	03/31/98	Durante et al.	423	248	
	5,759,946 ✓	06/02/98	Hoang et al.	502	303	
	5,780,700 ✓	07/14/98	Hagenmeyer et al.	585	617	

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EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
TN	6,156,695	12/05/00	Soled et al.	502	305	
TN	6,235,678	05/22/01	Mamedov et al.	502	354	

## FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
TN	EP 544 372 A1 ✓	06/02/93	EPO	B01J	27/19		
	EP 573 713 A1 ✓	12/15/93	EPO	C07C	253/26		
	EP 661 254 A2 ✓	07/05/95	EPO	C07C	5/48		
	WO 96/33149 ✓	10/24/96	PCT	C07C	5/327		
	WO 99/42404 ✓	08/26/99	PCT	C01G	51/00		
✓	WO 99/64160 ✓	12/16/99	PCT	B01L	3/02		

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER INITIAL	
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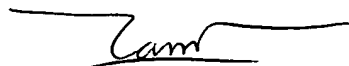
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TN	Baiker, Alfons, "Recent Developments in Heterogeneous Catalytic Oxidation for Fine Chemicals Synthesis," 5th International Symposium on Heterogeneous Catalysis and Fine Chemicals, Lyon, France, Aug. 30 – Sept. 3, 1999, PLI1	
	Barrault, J., et al., "Selective Oxidation of Propane into Oxygenated Compounds over Promoted Nickel-molybdenum Catalysts," 3rd World Congress on Oxidation Catalysis, pp. 375-382	✓
	Dalmon, et al., "Hydrogenolysis of C <sub>2</sub> H <sub>6</sub> , C <sub>3</sub> H <sub>8</sub> , and n-C <sub>4</sub> H <sub>10</sub> over Silica-Supported Nickel-Copper Catalysts," Journal of Catalysis, 66, 214-221, (1980)	✓
	Ducarme, et al., "Low Temperature Oxidative Dehydrogenation of Ethane over Ni-based Catalysts", 23 Catalysis Letters 97-101 (1994)	✓
	Ducarme, V., et al., "Low Temperature Oxidative Dehydrogenation of Ethane Over New Catalysts Based on Group VIII Metals," Symposium on Heterogeneous Hydrocarbon Oxidation Presented before the Division of Petroleum Chemistry, Inc., 211 <sup>th</sup> National Meeting, American Chemical Society, New Orleans, LA, March 24-29, 1996, pp. 153-156	✓
	Ducarme, V., et al., "Oxidative Dehydrogenation of Ethane at Low Temperature Over Nickel Catalysts: Influence of Morphology and Chemical State of the Solid During Reaction," Studies in Surface Science and Catalysis, Vol. 107, 361-366	✓
	Jalowiecki-Duhamel, L., et al., "Oxidative Dehydrogenation of Propane on CeNi <sub>x</sub> O <sub>y</sub> (0≤x≤1) Mixed Oxides Hydrogen Acceptors," 3rd World Congress on Oxidation Catalysis, pp. 383-392	✓
	Ji, Lang., et al., "Effect of Group VIII Elements on the Behavior of Li/CaO Catalyst in the Oxidative Dehydrogenation of Ethane," React. Kinet. Catal. Lett., Vol. 62, No.1, 121-128 (1997)	✓
	Juarez, Lopez R. et al., "Oxidative Dehydrogenation of Ethane on Supported Vanadium-Containing Oxides," 124 Applied Catalysis A: General 281-96 (1995)	✓
	Lin, Manhua, et al., "Reaction Intermediates in the Selective Oxidation of Propane Over a Mixed Metal Oxide Catalyst," Proceedings ISO'99, Rimini (Italy), Sept. 10-11, 1999, G. Centi and S. Perahoner Ed., SCl Pub. 1999, pp. 143-144	
	Liu, Yumin, et al., "High-Throughput Synthesis and Screening of Mixed Metal Oxides for Ethane Oxidative Dehydrogenation to Ethylene," 4th European Congress on Catalysis, Rimini, Italy, September 5-10, 1999, Book of Abstracts, p. 41	
	Liu, Yumin, et al., "High-Throughput Synthesis and Screening of V-Al-Nb and Cr-Al-Nb Oxide Libraries for Ethane Oxidative Dehydrogenation to Ethylene," Proceedings ISO'99, Rimini (Italy), Sept. 10-11, 1999, G. Centi and S. Perahoner. Ed., SCl Pub. 1999, pp. 117-118	
↓	Nazimek, D., "Influence of Added Copper on the Activity of Ni/Al <sub>2</sub> O <sub>3</sub> Catalysts in the Hydrogenolysis of n-Butane," React. Kinet. Catal. Lett., Vol. 13, No. 4, 331-337 (1980)	✓

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. TN	Popova, et al., "Characterization of Nickel Loaded Mordenite Catalysts by Temperature Programmed Reduction," React. Kinet. Catal. Lett., Vol. 39, No. 1, 27-32 (1989)	✓
.	Richardson, J.T., et al., "Characterization and Deactivation of NiO-ThO <sub>2</sub> Catalysts," Applied Catalysis, 48, (1989) 159-176	
	Schuurman, Y. et al., "Low Temperature Oxidative Dehydrogenation of Ethane over Catalyst Based on Group VIII Metals," 163 Applied Catalysis A: General 227-35 (1997)	✓
	Sinfelt, et al., "Catalytic Hydrogenolysis and Dehydration Over Copper-Nickel Alloys," Journal of Catalysis, 24, 283-296 (1972)	✓
	Thorsteinson, E. M. et al., The Oxidative Dehydrogenation of Ethane over Catalyst Containing Mixed Oxide of Molybdenum and Vanadium," 52 J. Catalysis 116-32 (1978)	✓
✓	Zhang, Mingqian, et al., "Calcium-Nickel-Lithium Oxide: a High Selectivity Catalyst for the Oxidative Dehydrogenation of Ethane to Ethylene," J. Chem. Soc., Chem. Commun., 1993, pp. 1480-1481	✓

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